PLAN OF WORK

CHICKASAW-METROPOLITAN SURFACE WATER MANAGEMENT SURVEY

USDA-SCS-FORT WORTH, TEX. 1967

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CHICKASAW-METROPOLITAN SURFACE WATER MANAGEMENT SURVEY

UNITED STATES DEPARTMENT OF AGRICULTURE

IN COOPERATION WITH

THE TENNESSEE DEPARTMENT OF CONSERVATION

THE SHELBY COUNTY CONSERVATION BOARD

THE SHELBY COUNTY SOIL CONSERVATION DISTRICT

THE MISSISSIPPI BOARD OF WATER COMMISSIONERS

1967

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INTRODUCTION

The United States Department of Agriculture has been requested by the Tennessee Department of Conservation to assist the Shelby County Conservation Board in making a river basin survey of the area drained by all the streams, except the Mississippi River, flowing through Shelby County, Tennessee. These streams are the Loosahatchie River, Wolf River, Nonconnah Creek, and Horn Lake Creek. The survey will be made under the provisions of Section 6, Public Law 566, the Watershed Protection and Flood Prevention Act of August 4, 1954, as amended. Section 6 authorizes the Secretary of Agriculture in cooperation with other Federal and with States and local agencies to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs. The study will give special attention to water and related land resource development opportunities as a means to stimulate economic growth and enhance the welfare of the people of the Basin. Special attention will also be devoted to related resource studies, surveys, and interpretations that will be helpful to planning groups in the orderly growth and development of metropolitan Memphis, particularly as related to clean water, parks, greenbelts, recreation areas, nature areas, etc.

The Secretary of Agriculture has designated the Soil Conservation Service to provide leadership in carrying out the Department's responsibilities in river basin studies. The Forest Service and Economic Research Service will participate under provisions of the Memorandum of Understanding attached to River Basins Memorandum-2 and under the provisions

of the Secretary's assignment of functions.

The area to be studied under the Chickasaw Metropolitan Surface Water Management Survey includes Memphis, Tennessee, and its environs, a progressive and expanding metropolis, and adjacent rural areas in which several small towns and communities are located. While the area has abundant natural resources, the rural areas have lagged behind other portions of the nation in economic growth. Water and land resources have been inadequately developed or not fully utilized. The basic problem or need is to correct this imbalance of growth for the benefit of the whole area by permitting the continued expansion of the urban and rural areas in an orderly, well planned manner.

DESCRIPTION OF THE BASIN

The Basin to be studied includes all the drainage area of the Loosahatchie River, Wolf River, Nonconnah Creek, and Horn Lake Creek with a total area of approximately 1,237,000 acres. All of these streams outlet into the Mississippi River at Memphis. All of Shelby County, Tennessee, is within the Basin. Portions of four other counties in Tennessee -- Tipton, Fayette, Haywood, and Hardeman - and four in Mississippi -- DeSoto, Marshall, Benton, and Tippah - are included. The Basin extends north, east, and southeast from Memphis. It is about 65 miles long and 35 miles wide.

Eighty five percent of the basin is in the South Atlantic and Gulf Slope Cash Crop, Forest and Livestock Land Resource Region. The Southern Mississippi Valley Silty Uplands comprise the major land resources. Loess accumulations ranging from four to thirty feet in thickness are found in the basin. The shallower loess areas are underlain by sandy and gravelly coastal plain materials.

Fifteen percent of the basin in its western portion is in the Mississippi Delta Cotton and Feed Grain Region. The major land resource area is composed of Southern Mississippi Valley Alluvium. This alluvial plain is formed from Mississippi River alluvium. It consists of recent natural levees, older natural levees, depressions of former stream channels, and slack water areas.

The basin is dominated by undulating to rolling landscapes - low hills with wide undulating tops and short side slopes. The dominant upland soils series, all developed in deep silt (loess) are Grenada, Loring and Memphis, the Grenada soils dominating. The nearly level bottom land along all the streams is dominated by Waverly, Falaya and Collins soils. The Waverly soils are dominant; they are grey, poorly drained and on the nearly level and lowest parts of the flood plain. Most of these bottom soils are silty; however, some have been covered with sand overwash which has been eroded out of the sandy uplands.

The rural area surrounding Memphis is rapidly becoming urban. The principal crops are cotton, corn, hay, soybeans, and oats in descending order. A sizable acreage is idle or in poor pasture. Some of the steeper hillsides and wet bottom lands are in timber.

This area has the highest rainfall erosion index in Tennessee (R=300+). This is a numerical evaluation of the capacity of the rainfall pattern (number of rains and intensity of rains) to erode soils from unprotected fields. The rainfall erosion index is twice as high as that for the vicinity of Johnson City (150). The high rainfall combined with frequent cultivation has resulted in severely eroded soils over about 25 percent of the area. Nearly eight percent of the area has been severely

gullied. The debris from the eroded uplands has clogged stream channels and caused a significant acreage of bottom land to become waterlogged.

The underlying unconsolidated sands and gravel of the Gulf Coastal Plain are extensive and productive aquifers - some wells yielding 2,000 g.p.m. Memphis alone pumps 60 million gallons per day from the aquifers.

Average annual precipitation is about 50 inches. Of this, about 20 inches runs off.

STATUS OF WATER AND RELATED LAND RESOURCE PROGRAMS

There are many going soil and water and related resource programs in the Basin. The wide acceptance of these programs is evidence that the people of the basin are aware of the need for the conservation and wise use of their land and water resources.

Soil Conservation District Program

Soil Conservation Districts are in operation in all of the nine counties in the basin. They are making major contributions in the conservation and development of soil and water resources. The districts are organized under State law, are legal entities of the State and are managed by local people. Districts have furnished the local leadership and responsibility for carrying out a remarkable program of land and water conservation. About one-third of the farms in the basin are now or have already received assistance by districts.

Most of the technical assistance for districts is supplied by the Soil Conservation Service with full-time personnel assigned to each district headquarters. Technical assistance is also furnished to the districts by other Federal and State agencies.

Agricultural Extension Service

The Extension Service provides educational and organizational assistance to groups and individuals for planning and implementing resource development programs. It provides scientific information and advice for farm improvement, livestock and crop production and farm management. It offers training and information to recreation leaders and assists in evaluation of proposed recreation projects. Its expanding efforts in resource development are expected to have great impact in all areas of the Basin.

National Forests

The boundaries of the Holly Springs National Forest include about 43,000 acres of the headwaters of Wolf River in Benton and Tippah Counties, Mississippi. The 12,000 acres of National Forest land within these boundaries are managed by the Forest Service, USDA, for the production of wood, wildlife, recreation, and water.

At the time of acquisition for National Forest purposes much of the area was old eroding cotton fields with intervening areas of over cut, frequently burned and heavily grazed forest land. Sediment production was high and the once excellent hydrologic capabilities of the soil had been lost through erosion and compaction. National Forest management has restored forest cover and productivity to badly depleted areas. All but the most persistent erosion has been stabilized, sediment production greatly reduced and hydrologic functioning of the soil is being rebuilt through management techniques. Continuing programs work toward complete watershed rehabilitation.

Cooperative State and Private Forestry Programs

The Tennessee Division of Forestry and the Mississippi Forestry Commission in cooperation with the Forest Service, USDA, conduct forest fire protection, insect and disease control, watershed and forest management programs on all State and privately owned forest lands in the Basin.

Flood Prevention Projects, Flood Control Act 1944 - (PL-534)

The Yazoo and Tallahatchie flood prevention projects are in North Mississippi adjacent to the Basin. The close proximity of these projects is expected to favorably influence interest and participation in similar group undertakings in the Basin.

Watershed Protection and Flood Prevention Act (PL-566)

The Mary's Creek and Sand Creek Pilot Watershed projects are within the Basin. Two other watersheds - Indian Creek and Grays Creek - have been authorized for operations under P.L. 566. Both land treatment and structural measures are included in these work plans and nearly all of the planned measures have been installed.

There is renewed interest in the program as a tool for solving some of the multiple resource problems affecting both urban and rural portions of the basin. Land treatment, including vegetation to control erosion, reduces sedimentation, improves the quality of water and stabilizes stream flow.

Agricultural Conservation Program and Cropland Adjustment Program

These programs provide Federal cost-sharing for certain conservation measures and adjustment payments for cropland diversion. Soil conservation practices applied under these programs improve the quality of water through reduction of soil erosion and sedimentation. They also reduce

or slow surface runoff and provide water storage for agricultural, recreation, and other rural uses. The Cropland Adjustment Program helps farmers divert cropland to protective conservation uses under long-term agreements. Extra incentives are offered farmers who wish to provide free public access for hunting, fishing, hiking and trapping. Both these programs contribute to the establishment of grass and tree cover on sloping cropland, thus reducing erosion and slowing surface runoff.

Watershed and Soil and Water Conservation Loan Program

The Farmers Home Administration provides loans and technical assistance directly affecting the development of water and related land resources of the basin. This includes watershed loans to help local sponsors finance their share of project costs; water development and soil conservation loans to develop water supply systems for irrigation, household use and livestock; to drain farmland and carry out soil conservation measures; farm ownership loans to help improve, enlarge, develop and buy farms; loans for rural housing, including water supply; loans to individuals to develop income-producing recreation enterprises, and to groups or associations for non-profit recreation enterprises.

Under a recent amendment FHA is permitted to make loans for community water systems to towns up to 5,500 population. This legislation also allows grants up to 50 percent of the development costs of domestic water and waste systems.

The FHA programs are making highly beneficial contributions towards improving the economic conditions in rural areas. Management services of the agency contribute to better conservation, use and development of land and water resources.

Research

Research in fields related to the water and related land resource problems of the Chickasaw Basin is being conducted by several agencies. Research projects in the fields of watershed rehabilitation, coastal plain hydrology and management of erosive watersheds directly applicable to the Chickasaw-Metro Basin are being conducted by the Oxford (Mississippi) Branch of the Southern Forest Experiment Station. Research data in the fields of water quality, water yield and sedimentation are expected to be especially valuable in the study. Applicable findings in these and other fields will be utilized.

PROBLEMS AND NEEDS

Flood Prevention

Flooding is a major problem on the larger streams and most of the upstream tributaries throughout the basin. Floods damage crops, land, property, utilities and services. The threat of high flood damages has prevented industrial and urban development along the flood plains of the larger streams. Croplands located on the flood plains, of major importance to the economic development of the area, are subjected to severe flooding resulting in loss and damages to crops.

The runoff is irregular, most of it occurring during the late winter, early spring and during local high intensity storms in the summer. In the upper watersheds of the basin there are long periods of low flow, usually at times of greatest need for water.

Erosion and Sediment

Erosion and resulting sedimentation create severe problems in many areas of the Basin. Average annual soil losses of 50 tons or more per

acre are not unusual on upland fields cropped continuously to cotton and without conservation measures. Steep bare roadbanks have annual soil losses of from 5 to 7 times as much. Watersheds having urban development such as new housing usually have aggravated runoff, erosion and sedimentation problems. Raw gullies throughout the area also contribute to the sediment load, choking main and tributary stream channels.

It is estimated that for every acre of sloping upland in farms in the area, there is an average annual soil loss of about 8 to 12 tons per acre. In the western and central part of the area, the soil losses consist dominantly of silt. In the eastern one-third of the area, large quantities of sand and silt are being eroded from the uplands. This eroded sediment has filled many of the stream channels and in places is covering the fertile bottom land with sand. Since many of the stream channels are filled, flooding is more common and many acres of once productive bottom land are no longer in cultivation. Many areas have grown up with undesirable trees or are idle. In some areas, the erosional debris and flooding has caused some of the trees to die and "swampy" areas are forming. The damaging effects of upland erosion will continue to increase unless action is taken to reduce erosion on uplands. Erosion, therefore, is a two-fold hazard in that it threatens production potentials of upland soils increasing future costs of crop production and creates off-site problems that reduce potentials for development without costly remedial measures.

Water Management

A major problem of the basin is the management and control of surface water to reduce erosion, sedimentation and overland flow. Irregu-

lar stream flow ranges from none in dry seasons when there are needs for irrigation to heavy flooding during periods of intense precipitation. There are some problems of pollution due both to sediment and the use of agricultural chemicals. There are needs for clear unpolluted lakes and streams with adjacent areas of natural beauty for outdoor recreation such as water sports, hunting, and fishing. Irrigation water for high-value specialty crops such as vegetables and ornamentals is needed to allow maximum economic development.

Watershed Protection

Row crops of cotton, corn, and soybeans occupy a sizable acreage of sloping cropland in the Chickasaw Basin. Much of this acreage is cropped continuously without adequate conservation measures. Preliminary results of an unpublished soil-loss survey for similar land use and cropping patterns in an area of West Tennessee show an average annual soil loss of 54 tons per acre. Information gathered in the Yazoo River watershed over a 2-year period shows that cotton fields planted in straight rows across the slope lost 58 percent of the rainfall and 195 tons of soil per acre.

Sedimentation resulting from such heavy soil losses causes many off-site damages. Drainage ditches and canals for removing surface water from highways, agricultural land, residential and industrial areas become clogged with silt bars thereby reducing their usefulness and requiring expensive maintenance. Reservoirs for all uses receive this sediment, causing them to fill and stay muddy. This reduces their value for recreation and sources of clean water. Thus, soil losses from sloping unprotected cropland becomes a public problem of great proportion.

Losses to the individual and the total economy of the Basin caused

by excessive erosion can be illustrated as follows: Grenada, an extensive sloping upland soil in the Basin, could be changed from a slightly eroded phase to a severely eroded phase in about 18 years if losses continue at the 50 plus tons per acre rate indicated above. This would result in an annual yield reduction of 14 bushels of soybeans, 250 pounds of lint cotton or 30 bushels of corn per acre. At present prices, this amounts to $43.00, $75.00, and $42.00 respectively per acre in lost income caused by excessive erosion.

Land use changes are needed for some areas now used for row crops. Such changes would be to pasture, hay, and woodland. But economic restraints are against such shifts in land use. Absentee ownership and farms owned by elderly persons comprise a large number of the farming units. Many of these farms are rented to individuals that own farm machinery. Leases are on a short-term basis - often year-to-year. Row cropping offers the highest short-term income under this type of leasing arrangement. Too, banks are generally more interested in making short-term loans. This further discourages landowners from making land use shifts to pasture, hay, or timber production.

There are areas of poorly managed and low quality stands of grass and forest land in the Chickasaw Basin. These lands are not contributing their full potential to the economic welfare of the area.

Forest land patterns in the Basin consist of small scattered tracts in the lower reaches and flood plain areas with larger, more extensive tracts in the uplands and headwater areas. The forest areas are almost universally in need of improved management practices to replace deteriorated forests with productive stands of high-value species. Many acres

of forest land presently being cleared for soybean production are unsuited for long term crop use. The use of sound land management principles and soil survey data is needed to guide clearing of forest land for row crops or pasture. The present hydrologic condition of upland forest land is far below its potential to infiltrate, percolate, and detain precipitation and must be built up through management techniques.

Many small tracts of privately owned forest land in the lower Basin contribute to the scenic beauty of the Memphis areas. Strategically located tracts selected for management as wildlife, recreation, or forested park areas would maintain some of the rustic natural beauty of the area.

OBJECTIVES, SCOPE, AND EXPECTED RESULTS

The primary overall objective is to facilitate a process of orderly development, use, and management of available water and related land resources. A plan will be developed which will consider and identify a desirable combination of agricultural production, industrial expansion and urban development which will produce maximum basin benefits. The plan will provide for (1) the sound development and use of flood plains for parks or greenstrips, agricultural production or urban and industrial areas depending on the degree of flood control and water management attainable; (2) the potential development of additional recreational facilities to meet present and emerging demands; and (3) the development of adequate water supplies for domestic, agricultural, and industrial purposes. Consideration will also be given to the conservation and development of the existing scarce land and water resource base.

Programs formulated by USDA for these purposes will promote economic

growth and development which are consistent with overall national objectives. The components of the USDA plan will also contribute to the satisfaction of current and long term basin needs and provide for a desirable resource utilization plan.

The local sponsors may use information developed in this survey immediately in land use planning, budget planning, establishing priorities for the expenditure of funds, and early acquisition of lands needed for floodwater retarding and multiple-purpose dams, recreational areas and parks, and other improvements. The rapid expansion of urban areas with the resultant increase in land values makes this a matter of urgency.

The sponsors expect to supply data useful in urban or metropolitan planning to the Memphis and Shelby County Planning Commission and other planning groups in the basin. The Survey Staff will inform such planning groups as to the type data being collected in the study. The sponsors will assist in coordinating the river basin study with related studies carried out by other groups.

The Basin report will provide a framework within which needed projects can be developed in proper relationship to each other. Coordinated, comprehensive, detailed surveys will be made of subbasins in accordance with priorities set by the USDA and the local sponsors. Within these areas, the U. S. Department of Agriculture will study upstream watersheds to the intensity necessary to determine their problems, minimum project objectives, and potential feasibility as watershed projects. These studies will be comparable to preliminary investigations made in the P.L. 566 watershed program and will be made on all watersheds which appear to have some potential for future development and which have not been studied

under the Pilot Watershed or the P.L. 566 program. Plans already developed for these projects will be fully integrated into the overall basin survey.

It is expected that these studies will identify upstream watershed projects which could have significant effect on local and subbasin economic growth and development. These watersheds would be closely integrated with and would complement downstream developments proposed in the subbasin concerned. Those projects which should be installed in the next 10 to 15 years will be identified.

MAJOR ELEMENTS OF THE SURVEY

Major elements of this survey will consist of the following items:

1. An appraisal will be made of all water and related land resources. This will include, but not be limited to data on soil surveys, rainfall and stream flow, land use, fish and wildlife, recreation, and parks. All pertinent published reports, including those prepared by consulting firms, will be obtained and used.
2. Studies and projections of economic development will be made. Economic data including projections will be developed for the study area. Items will include the following:
   A. Volume and value of agricultural output, including timber production.
   B. Income and employment in basic agricultural and forestry activities.
   C. Use of rural lands, including the acreage devoted to major crop groups, forest production, recreation, and fish and

wildlife.

D. Employment, income and other measures of economic activity, directly and locationally related to the basic agricultural and forest industries.

Competition has developed for the land and water base, and anticipated future economic growth will sharpen this force in the future. In some areas, this will be primarily between different types of agricultural production. However, in most areas of the basin, additional land and water will be required for urban and industrial expansion. Increased population along with higher incomes and more leisure time will quicken the need for additional recreational facilities. Adequate planning for development and use of resources for these competing uses can only be achieved after thorough examination and appraisal, both now and in the future, of all sectors of the economy. Successful resolution of these conflicts will enhance the potential for desirable economic growth. In this respect, the projections of resource use will consider all demands in proper perspective. The projections which result from this study will be internally consistent and compatible with national requirements for goods and services and will be made for the years 1980, 2000, and 2020.

3. The above information will be used in determining problems, shortages, needs and opportunities for resource development.

A. The need for agricultural, rural community, industrial, recreational water, and the related land resource develop-

ment will be determined for the years 1980, 2000, and 2020 primarily from these sources:

(1) The regional economic data and projections from other studies as it is available.

(2) Special USDA investigations of agricultural, rural community, industrial, and recreational water deficiencies or excesses.

B. Determination of resource development needs involves the translation of projections into needs for water and related land resource uses. Resource development needs will be determined by:

(1) Estimating the occurrence of water shortages, water surpluses, deficiencies in water quality, land losses due to water action, and inefficiencies in use of both water and related land.

(2) Assessing the economic need for development, measured in terms of economic losses and economic opportunities forgone in the absence of development for a specified purpose or use.

(3) Collaboration with other Federal, State, and local agencies to achieve a complete and consistent assessment of water problems.

4. Upstream watersheds showing a potential for P.L. 566 programs will be selected and identified. Needed structural and land treatment measures will be identified and evaluated as to physical and economic feasibility. Major elements of consideration

will be flood protection; water supply for recreational development, municipal or industrial use and irrigation; improved water quality; stream channel rehabilitation, and fish and wildlife enhancement.

5. The remainder of the Basin not included in feasible upstream watershed projects will likewise be studied as in the above item. Similar measures will be identified. All upstream programs and the measures needed in the remainder of the subbasin will then be evaluated as one unit. Plans for all water and related land resource developments that can be accomplished by private, semi-private or public interests will be formulated.
6. Studies will be utilized to help locate areas needed and suited for parks, greenbelts or greenstrips, nature areas, bridle paths, arboretums, bird sanctuaries, and areas or sites to be preserved for their beauty or historical values.
7. Governmental and private institutions and organizations having interest in and capability for solving problems and contributing to the development of the water and related land resources will be identified. Appraisal will be made of opportunities for resource development under current laws and existing programs, and the limitations, constraints and inadequacies of such programs will be determined.
8. In cooperation with other concerned agencies, alternative methods of water and related land resource development will be considered.
9. A report covering the survey, including a comprehensive water

and related land resource development plan, will be prepared.

GENERAL PROCEDURES FOR THE SURVEY

The Survey Staff, under the guidance of the Soil Conservation Service in consultation with the Field Advisory Committee, will develop and then follow a work outline to accomplish the objectives, and to include the major elements, shown on pages 31-33. This will include (1) compiling available basic data, (2) obtaining additional needed data through field surveys or interviews, (3) liaison with cooperating agencies and local sponsors and groups, (4) developing a Basin plan, (5) preparing reports, and (6) the scheduling of activities to complete the survey within the allotted time.

The Survey Staff will select upstream watersheds, and then develop a plan for each. It will also develop an overall basin plan, of which upstream watershed work plans will be integral parts. All opportunities for resource development will be pointed out, even though changes in laws, policies, or criteria may be needed before plans for these needed developments can be implemented.

Current P.L. 566 criteria will be used in determining benefit-cost ratio of proposed watershed programs. When applicable, policies and procedures for this survey will follow those outlined in River Basin Memorandum SCS-10 and 12.

The Survey Staff will also make special resource related surveys and interpretations needed in locating parks, greenbelts, nature areas, recreation areas, lakes, etc. and will collaborate with and provide available assistance to conservation boards, city planning commissions, and other groups in locating, planning, and installing such facilities.

USDA AGENCY RESPONSIBILITY

Soil Conservation Service

The Soil Conservation Service has overall leadership for the survey with the technical responsibility for the following phases of the study in cooperation with the Economic Research Service and the Forest Service:

1. Determine the extent of present and projected damages from floodwater, erosion, sediment and poor agricultural water management practices. Determine the expected changes in land use and enhancement on land benefited by flood prevention and agricultural water management measures. These determinations will include, for example, such things as:
   A. Evaluation of sediment yield by sub-watersheds and a generalized projection of sediment deposition during the periods for which the study is made. Such projections shall be made "with" and "without project" development.
   B. General soil areas will be delineated and interpreted for alternative uses. Individual soils and soils landscapes offering alternative uses will be delineated from the standard soil surveys available for most of the area. Planning the use of these soil landscapes will take into account the potentials and the limitations of the soils. Factors to be evaluated will include permeability rates, bearing strengths, frequency of overflow and other characteristics that would be helpful in planning for (1) residential use with septic tanks, sewage lagoons or central sewage; (2) industrial; (3) recreational; (4) agri-

cultural; (5) transportational; or (6) other public areas such as parks.

Such delineation of general soil areas, with suitable interpretations, will allow planning the use of land in harmony with the physical nature of the areas within the basin.

Detailed soil surveys will not be made as part of this survey.

C. Determination of future flooding areas (with and without project development).

2. Determine the types of structural and land treatment programs needed in upstream areas to effectively reduce flood and sediment damages.

3. Inventory land treatment needs on privately owned land. Consult with the Forest Service where forestry measures on private lands are concerned.

4. In cooperation with other USDA agencies, determine the present and projected needs for high quality water for agricultural and other rural uses.

5. In cooperation with other USDA agencies, ascertain the present and projected needs for water and related land resource development for municipal and industrial water supply, recreation, fish and wildlife enhancement and other non-agricultural uses.

6. Determine the alternative uses of the land resources that will promote the orderly development and growth of the basin.

7. Determine the water storage needs and potential water storage

development within the basin.

8. Make studies, interpretations, maps, etc. of soil, water, and related resources useful to urban planners in projecting city expansion, travel patterns, industrial development, recreation needs, etc. as needed to coordinate basin water and related land resource development potentials.

9. In the development of land and water-related recreational opportunities, the SCS will:

   A. Provide BOR with an inventory of existing rural recreation developments on private lands. Estimate the number of visitor days of recreational use these developments can supply.

   B. Furnish an inventory of existing public recreation opportunities in upstream watershed projects and the extent of demand which these facilities can meet.

   C. Estimate the additional potential rural recreation developments on private lands which are consistent with projected land use and related social and economic factors.

   D. Estimate the extent of potential public recreational opportunities which appear to be physically feasible in potential watershed projects.

   E. Estimate the extent to which all these potential rural recreation developments on private lands and public recreation opportunities could meet current and projected net demands.

   F. Include appropriate economic evaluations of water-related recreation as a purpose in potential upstream watershed

projects.

10. Formulate a resource development plan for the Basin. The plan will include specific recommendations in such areas as land use, land treatment, multiple-use water resource development, sediment control, channel improvement stabilization and rehabilitation, flood prevention, landscape enhancement and beautification, etc.

11. Participate in preparing a report based on the results of the U. S. Department of Agriculture's study.

Economic Research Service

The Economic Research Service will undertake and be technically responsible for the following aspects of the survey, including arrangements for necessary technical consultation and assistance from staff members of SCS and FS, and with appropriate Federal and State agencies.

1. Compilation and analysis of secondary statistics relating to the economic base of the study area.

2. Identify and project:

   A. Economic activity in the agricultural and agriculture related sectors of the economy.

   B. Other economic activities in both the metropolitan complex and rural areas which are significant.

   C. The demand for land and water resources to support anticipated economic activities in the metropolitan rural areas.

3. Appraise the current and projected demand for goods and services derived from the Basin's resources and assess the need for development in relation to these requirements.

4. Analyze and evaluate agricultural and rural water management problems and determine relationships to economic development, particularly as regards agricultural volume and value of production, employment, and income. Consideration will also be given to demands and competition for land and water resources from the urban center.
5. In cooperation with other agencies, appraise the economic needs for water and related land resource development to support future regional and national demands for food and fiber, and to foster economic growth.
6. Appraise prospective economic impacts of formulated development plans and alternatives available on agricultural, rural, urban, and related sectors of the economy.
7. Analyze the recreational needs that can be satisfied by water and related land resource developments. This will be accomplished by:
   A. Translating the BOR projections of recreation demand into types of recreational activities in rural areas.
   B. Indicating the likely geographical distribution of such activities.
   C. Determining the interrelationships among these activities and other economic activities in the Basin.
   D. Assisting SCS in the determination of gross land use changes consistent with urban expansion, agricultural production needs and emerging outdoor recreational demands.
   E. Evaluating the impact of the total potential recreation

development on the rural economy of the Basin.

If BOR advises that it is unable to provide needed information, ERS, in collaboration with BOR, SCS, and the FS will make the necessary projections of recreation demand.

8. Participate in preparing a report on the results of the U. S. Department of Agriculture's study.

Forest Service

The Forest Service will be technically responsible for the following phases of the study in cooperation with the Soil Conservation Service and the Economic Research Service:

1. Interpret and extrapolate Forest Survey data with special references to the purposes and requirements of the water resource survey.
2. Analyze and develop projections for the forest resource sector of the economy; statistics on forest resources and forest-based industry and employment, considering such changes as would be generated by the proposed basin plan for development.
3. Appraise present and projected water requirements and effluent characteristics of forest based industries, particularly pulp and paper.
4. Analyze use, treatment, development, and management of National Forest and other forest lands to meet basin-wide needs for water and related land resource development.
5. Develop forest resource and forest hydrologic aspects of upstream watershed development proposals and appraise the modification in runoff which is likely to occur with prospective levels

of use and management.

6. Appraise the impact of proposed water resource development projects upon the forest resource and forest-based enterprises of the basin with particular emphasis on impacts to the National Forests.
7. Participate with other concerned agencies in the formulation of a coordinated plan to provide for the needs for watershed related land resource development of the basin.
8. Make such studies and interpretations of forest resources as may be needed by urban planners in the location and development of public owned forests, forested areas with parks, nature areas, etc.

ACTIVITIES OF COOPERATING ORGANIZATIONS

The Shelby County Conservation Board, Shelby County Court, Shelby County Soil Conservation District, and the Mississippi Board of Water Commissioners are local sponsors of this basin survey. It is expected that other Soil Conservation Districts, County Conservation Boards, County Courts, and other groups will join in and actively support the survey. The Soil Conservation Districts will be the focal point for cooperation with other local groups.

It is anticipated that a basin-wide Chickasaw Advisory Committee will be formed to represent local interests. This committee would meet periodically with the Field Advisory Committee to review progress, make suggestions, and maintain coordination between USDA and local people.

The local sponsors are expected to (1) maintain liaison with the basin survey through the Field Advisory Committee, State Conservationists

for Tennessee and Mississippi, and the basin survey staff; (2) cooperate with survey staff in informing the public as to the purposes and objectives of the basin survey; (3) assist in developing a favorable attitude toward these surveys by landowners and other organizations and groups that may be affected directly or indirectly by survey activities; (4) counsel and advise the Field Advisory Committee and the survey staff in the effort to avoid identification with special interest, economic or political groups; and (5) participate in procedures for review and comment by concerned agencies, groups, and individuals on each major phase of the survey and report.

State

The Tennessee Department of Conservation on behalf of the Shelby County Conservation Board requested this Basin survey. Agencies of the U. S. Department of Agriculture will work closely with the Tennessee Department of Conservation, the Mississippi Board of Water Commissioners, Game and Fish Commissions for both States, and other State agencies which have responsibilities in the field of natural resources. These working relations will be similar to those established through administration of present regular programs.

Federal

Since the Corps of Engineers has been active in the basin, arrangements will be made to obtain such appropriate data and information as it may possess. The work and programs of all agencies will be reviewed as sources of data. Departmental agencies will seek continued cooperation and maintain close contacts with all agencies concerned with resources of the basin.

ARRANGEMENTS FOR COORDINATION

The work of the Department will be coordinated with the other agencies and groups by the USDA Field Advisory Committee. Guidance will also be furnished by the USDA Washington Advisory Committee.

The work of the Economic Research Service, the Forest Service, and the Soil Conservation Service will be coordinated by the USDA Field Advisory Committee.

Work within the three agencies will be coordinated as follows:

Economic Research Service

In addition to participation in the activities of the FAC, the Economic Research Service will conduct certain economic phases of the study. Major participation will be accomplished through assignment of one professional staff member to the River Basin Survey Staff. Special technical assistance will be supplied by the Little Rock office of the Economic Research Service.

Forest Service

Field work will be performed by a forester assigned to the River Basin Survey Staff at Memphis. Special technical assistance will be supplied by the Atlanta office of the Forest Service.

Soil Conservation Service

The actual work of making this River Basin Survey and preparing the required reports and plans will be done by personnel assigned to a River Basin Survey Staff by the State Conservationist in Tennessee. Procedures will be developed for review and comment by concerned agencies, groups, and individuals on each major phase of the survey and the report.

Although only a small portion of this Basin is in Mississippi, the

counsel and participation of interested groups in that State will be actively solicited. Sponsorship of the survey and appropriate representation on the Chickasaw Advisory Committee by these groups will be invited and encouraged. The Field Advisory Committee and the survey staff will draw upon the experience of the State Conservationist for Mississippi and his River Basin Planning Staff.

ADMINISTRATION OF THE SURVEY

The Soil Conservation Service has been designated to provide overall leadership for carrying out the U. S. Department of Agriculture's responsibilities for the River Basin Surveys.

The Department's part of the survey will be under the general guidance of a USDA Field Advisory Committee (hereafter identified as FAC) which has been established to maintain close field working relations among the three departmental agencies. Members of the FAC, consisting of the Soil Conservation Service, with chairmanship, the Economic Research Service, and the Forest Service will set guidelines and outline procedures consistent with National standards to insure uniformity of effort and the final result.

A USDA River Basin Survey Staff will be established and all positions filled as soon as possible. This staff will be given the responsibility of conducting the survey and completing the report by June 30, 1969.

The Field Advisory Committee for this survey is as follows:

J. R. Sasser, Chairman
State Conservationist
Soil Conservation Service
561 U. S. Courthouse
Nashville, Tennessee 37203

Carter P. Qualls, Chief
River Basin Programs
Southeastern Area
U. S. Forest Service
Room 336, 50 Seventh St.
Atlanta, Georgia 30323

Nathan G. Mallett, Leader
Southern Resource Group
Economic Research Service
315 U. S. Post Office & Courts Bldg.
Little Rock, Arkansas 72201

The funding of the Department's participation in this survey will be as follows:

Agency	FY 1967	FY 1968	FY 1969	Total
Soil Conservation Service	$ 85,000	$ 85,000	$ 85,000	$255,000
Shelby County Conservation Board	(25,000)	(25,000)	(25,000)	(75,000) 1/
Economic Research Service	10,000	15,000	15,000	40,000
Forest Service	15,000	10,000	10,000	35,000
	$110,000	$110,000	$110,000	$330,000

1/ $25,000 transferred each year by the Shelby County Conservation Board to the Soil Conservation Service in Tennessee through a trust fund agreement.

The Soil Conservation Service will establish a River Basin Survey Staff to be located at Memphis, Tennessee. The staff will include the following positions:

Survey Coordinator

Assistant Survey Coordinator

Hydrologist

Assistant Hydrologist

Economist

Assistant Economist

Civil Engineer

Assistant Civil Engineer

Two Engineering Technicians

Geologist

Secretary

Calculator Operator

WAE's to assist with field surveys

This staff will have those responsibilities already outlined in this plan of work for the Chickasaw Basin Survey. In addition, this staff will have similar responsibilities in connection with the separate Hatchie River Basin Survey.

The Economic Research Service in carrying out its responsibilities will assign an Agricultural Economist to the Basin Staff as shown above.

The Forest Service in meeting its responsibilities will assign a forester to be headquartered with the Basin Staff.

PROGRESS REPORTS

The River Basin Survey Staff shall submit a brief, narrative type report monthly to each member of the Field Advisory Committee. The report will be due by the 10th of the following month. It shall contain information on public contact, inter-agency cooperation, problems, progress since previous report, schedule for the next month, fiscal status, and other pertinent matters.

At the end of each quarter of the fiscal year, a quarterly report will be submitted by the River Basin Survey Staff to the Field Advisory Committee. This report shall be similar in format to the monthly report

and will replace it for that month.

The Field Advisory Committee will make any change or additions to the quarterly report it feels necessary, and then send copies of it to the Washington Advisory Committee through SCS channels.

The local sponsors should arrange to keep the Field Advisory Committee, through the Basin Survey Staff, informed as to the activities it is carrying out.

Special reports may be required from the Survey Staff from time to time as needed.

SCHEDULE OF PLANNED ACTIVITIES

USDA Field Advisory Committee

Meetings will be held as called by the Chairman and will usually be held in Memphis, Tennessee. Minutes of these meetings will be distributed to members of the committee, the State Conservationist for Mississippi, the Survey Staff, and three copies to the Washington Advisory Committee.

Local Sponsors - Chickasaw Advisory Committee

It is recognized that the USDA Field Advisory Committee is a policy-making committee and will meet periodically with the Chickasaw Advisory Committee for the exchange of ideas, change of policies, etc. The Chickasaw Advisory Committee will meet as needed. The Chairman of the Field Advisory Committee will maintain informal working relations and liaison with the Chickasaw Advisory Committee through its chairman.

Major Items of the Survey

July - December, 1966

1. Select River Basin Survey Coordinator and key staff members.
2. Prepare draft Plan of Work for review and approval by Field

Advisory Committee and Washington Advisory Committee.

3. Establish contact with present sponsors, potential sponsors and other agencies and groups who may participate in the study.

January - June, 1967

1. Complete staffing of survey party.
2. Final approval and signing of Plan of Work.
3. Meeting of SCS personnel involved in the Basin Survey.
4. Formation of Chickasaw Advisory Committee.
5. Development and approval of USDA Work Outline.
6. Obtain basic data - maps, aerial photos, quad sheets, soil surveys, rainfall and streamflow, recreation, conservation needs, etc.
7. Identify upstream watersheds, make field investigation, select those for more intensive investigations.
8. Begin watershed investigations, make tentative project formulation for upstream watersheds.

July - December, 1967

1. Formulation of tentative sub-basin and overall basin plans.
2. Continue watershed investigations.
3. Design and cost estimates, economic, and hydrologic evaltion of measures and combinations of measures.
4. Outline basin report.

January - June, 1968

1. Complete field surveys and investigations.
2. Continue evaluations.

July - December, 1968

1. Complete all cost estimates.
2. Complete all hydrologic and economic evaluations.
3. Continue work on report.

January - June, 1969

1. Complete the River Basin report.

Prepared by: USDA Field Advisory Committee

Date - March 29, 1967

J. R. Sasser	Nathan G. Mallett	C. P. Qualls
Chairman	Leader	Chief
Soil Conservation Service	Southern Resource Group	River Basin Programs
	Economic Research Service	U. S. Forest Service

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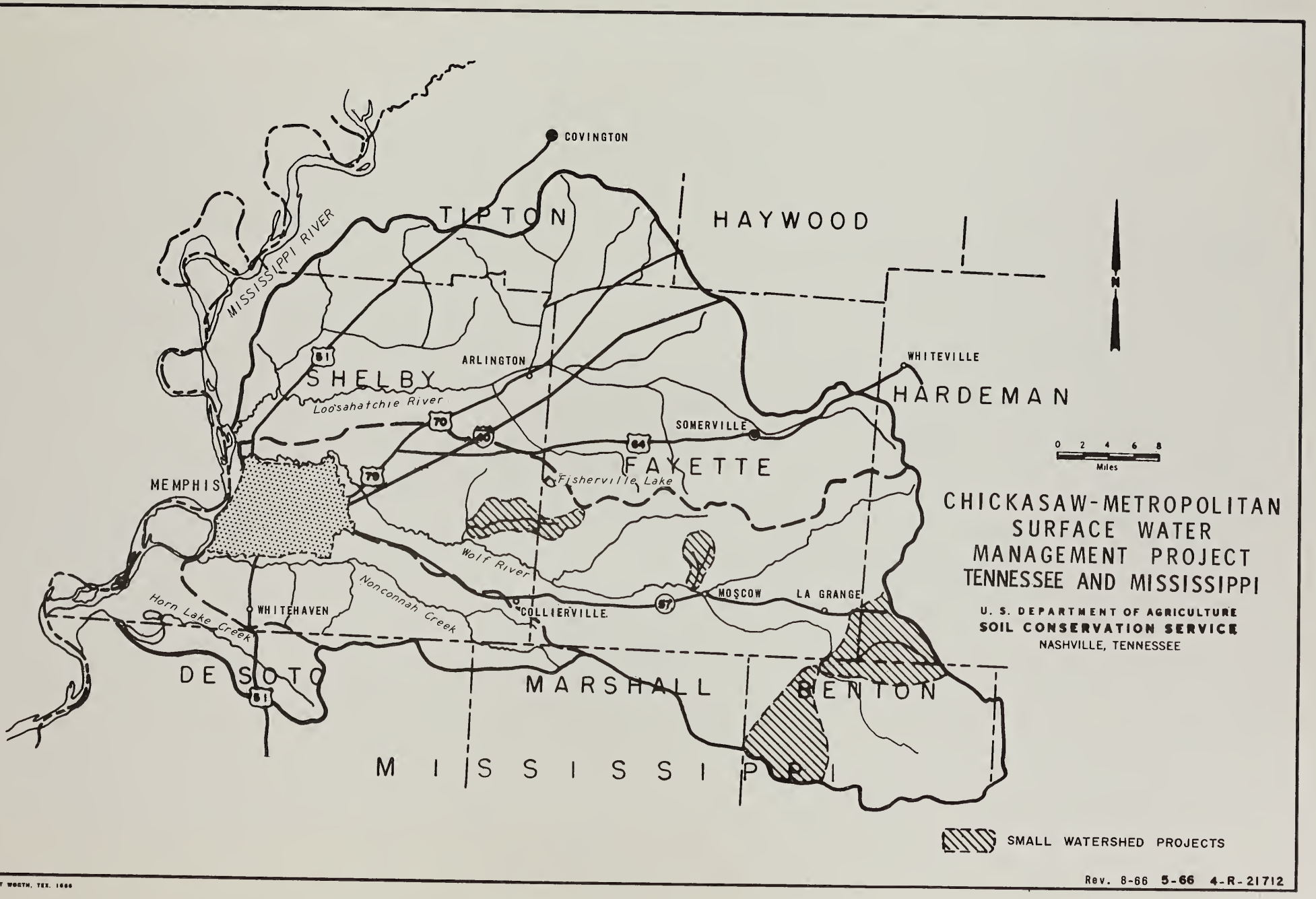

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